RESCUE OF EMPLOYEE FROM POLE

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1. GENERAL

1.01 This section specifies methods of rescuing an employee working aloft when due to electric shock, or for any other reason, help is required to lower the employee to the ground.

1.02 This section is reissued to include techniques to be followed when an employee on a pole is in need of assistance.

1.03 An employee could need help to get down from a pole for any one of the following reasons: illness; injury; rendered unconscious as a result of a physical blow, heart attack, or electrical shock. In any one of these situations, he or she may need help to reach the ground level safely. Sometimes a victim, in a state of traumatic shock, may need a few words of reassurance and a little assistance in descending the pole. Other times you may be required to lower an unconscious or severely injured employee.

1.04 The first aid to be rendered is dependent upon whether the employee on the pole is: conscious, unconscious but breathing, unconscious—not breathing, or unconscious—not breathing and the heart has stopped.

1.05 In some cases, the victim of an electric shock may remain in contact with the energized voltage source because of not being able to release the live conductor or due to an unconscious state. It should be assumed that all wires on the pole are energized unless it is definitely known that the cause of this disability is not electric shock or that contact with the energized voltage source has been broken. The rescuer shall take the precautions as specified in these instructions to prevent another injury due to electric shock.

1.06 In all cases where an employee has suffered a severe electric shock or is unconscious, another employee or a nonemployee, when available, should be directed to call the appropriate emergency unit (rescue squad, fire department, police, etc). The person placing this call should be directed to dial the 911 emergency number (if in use) or 0 for emergency assistance. The specific location of where the emergency assistance is required should be clearly identified. However, rescue efforts shall proceed and appropriate first aid techniques applied until assistance arrives. If the victim is conscious and can be moved safely, after receiving first aid, the employee should be taken to a physician as soon as possible.

1.07 In administering first aid and transporting the victim, follow the recommendations covered in the American Red Cross First Aid Text Book as taught in the System First Aid and Personal Safety Course.

1.08 The job vehicle should be brought near the scene of the accident as soon as practical, as it may contain useful equipment or it may be used as an insulated platform to effect the rescue and to transport the injured employee.

1.09 In electric shock cases, notify the power company involved as soon as practical.

1.10 This section and a Red Cross First Aid Text Book should be reviewed at intervals so that if an employee on a pole requires assistance, a

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rescue will be handled effectively. It is essential that each employee be prepared to cope with emergency situations and be able to provide lifesaving aid to any victim involved. The difference between life and death in many cases depends upon the knowledge, skill, and judgment exercised by the rescuer.

2. PLANNING THE RESCUE

2.01 The employee who first observes that a fellow worker on a pole may be the victim of an electric shock or is otherwise disabled shall, if others are present, immediately call out clearly and distinctly the location of the victim. The crew under the direction of one of its members as a leader shall start at once with the rescue operations as outlined in the following paragraphs.

2.02 Before starting the rescue, plan quickly but carefully how the operation can best be carried out. The most important details to be considered are the following:

(a) Probable cause of the disability (electric shock, sickness, fainting, etc). In an electric shock case, determine if possible the source of the shock and whether or not the contact has been cleared. If the energized voltage source is not apparent or if the nature of the disability cannot be determined from the ground, assume that the injured person is the victim of an electric shock and is still in contact with the voltage source.

(b) Availability of rescue materials such as a rope, insulating gloves, lineman's blanket, hard hat, pliers, tree pruner, "B" clearance rule, climbers, body belt, and safety strap. A nonmetal extension ladder may also be used under some conditions to facilitate a rescue of the victim.

(c) The placement of a sturdy rope (at least 3/8 inch hemp or 1/4 inch plastic) over a crossarm, cable and strand, or other suitable fixture to lower the employee to the ground level.

(d) Position the victim with respect to wires and other attachments on pole. Determine the approximate voltage if the victim is still in contact with a voltage source.

(e) Determine the method to be used in clearing contact between victim and source of shock. Consideration should be given to clear the power source prior to ascending the pole. If possible, tree pruner sections equipped with a wire-raising tool, a nonmetal extension ladder, or a "B" clearance rule might be used as a lever to break the power contact. In moving the victim clear, opening the switch, or cutting the wire, after ascending the pole, the rescuer must use protective equipment to insure his own safety. If wires are to be cut, consider the possibility of an unsound pole falling due to an unbalanced load affect on the pole.

(f) The rescuer in attempting to break a power contact should be ever mindful of the possibility of becoming a part of the power circuit to ground. Whenever possible the rescuer should stand on an insulating blanket, dry boards, or other dry insulating material to provide added protection and use tools and hardware that are completely dry and free from moisture. The use of the "B" clearance rule would not require the use of insulating gloves or the standing on additional insulating material.

(g) The side of pole to be climbed and position from which rescue work will be done.

(h) The point of attachment for rope to be used in lowering the victim (do not use cross-arm braces).

(i) Need for cutting wires or cables below victim which might interfere with rescue work and the lowering operation.

(k) Availability of vehicle and consideration of its use (with necessary precautions) as an insulated platform, particularly under wet conditions.

3. POWER SUPPLY VOLTAGES

3.01 The possibility of contact with a foreign potential is greatly reduced if clearance and separation requirements are followed on joint construction as described in Section 620-215-012.

3.02 Those cases where the proper separation is not or cannot be obtained should be referred to the Plant Engineer for prompt attention.

3.03 Insulating gloves are designed to protect a workman against possible exposure to voltages that could be encountered in certain work operations. In joint construction, any one of the following supply voltages could be encountered:

- Secondary distribution—600 volts or less,
- Primary distribution—2200 to 39,500 volts or,
- Subtransmission—26,400 to 69,000 volts.

In most instances, power company facilities on joint use poles have supply voltages lower than 10,000 volts to ground—the maximum limitation of our insulating gloves. The supply voltages quoted reflect phase-to-phase voltage. The voltage from one wire to ground is approximately 58 percent of the phase-to-phase voltage (except in the case of a grounded delta circuit where it is 100 percent). Therefore, the voltage to ground on a 26,400-volt subtransmission line would be approximately 15,240 volts — higher than the limits of the insulating gloves. Therefore, it is imperative that employees be able to identify voltages and take additional precautions when exposed to voltage above 10,000 volts.

3.04 In some instances, power company facilities on joint use poles have supply voltages that are lower than 10,000 volts to ground — the maximum of our insulating gloves. Where the time of the exposure may be appreciable (2 to 3 minutes), insulating gloves will withstand voltages of about 15,000 volts to ground for a few seconds.

3.05 Power conductors immediately above telephone facilities, if attached to spool type insulators on crossarms, can safely be assumed to be secondaries with voltages less than 600 volts.

3.06 It is quite common to also have a primary distribution supply, above the secondary distribution, with a voltage range of 2200 to 34,500 volts.

3.07 A rescuer could safely clear a power contact by handling a conductor if the voltage is 10,000 volts or less while wearing insulating gloves. However, additional protection is provided the rescuer when using a dry handline, board, pruning sticks, "B" clearance rule, etc, in addition to the insulating gloves.

3.08 Bell System engineering practices require that workmen be alerted to the supply voltage present on joint construction in placing outside plant facilities. This information is posted on the work prints and should alert construction employees performing the work of the existing voltage-to-ground potential.

3.09 A rescuer can estimate the voltage of a contact by observing the size and type of insulator, voltage markings on a transformer, position of supply conductors on pole, etc (see Fig. 1, 2, and 3).

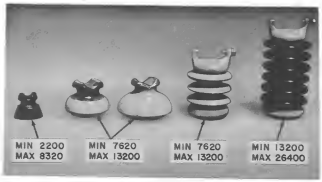

Fig. 1—Examples of Voltage Range of Power Company Insulators

3.10 Employees should make it a point to acquaint themselves with the power company facilities in locations where they work so they may be able to estimate the supply voltages.

4. ASCENDING THE POLE

4.01 The key to a successful rescue is to size up the situation before ascending the pole. Good judgment and common sense must be used to evaluate the situation.

4.02 The rescuer must consider providing the necessary personal protective equipment to prevent exposure to a power contact, if one is present, as well as the necessary items to break a power contact from a victim's body.

4.03 The rescuer shall equip himself with a coiled rope, insulating gloves (if necessary), and other necessary materials before ascending the pole. A rescue rope should be in good condition,

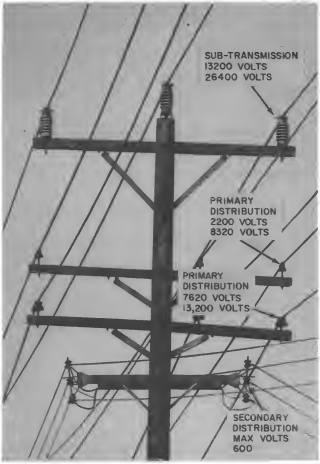

Fig. 2—Examples of Electrical Power Supply Voltages

Fig. 3—Typical Transformer With Primary Marking of Supply Voltage

(at least 3/8 inch hemp, 1/4 inch plastic) and long enough to permit the victim to be lowered to the ground.

4.04 Climb the pole and get in the proper position, exercising every precaution to avoid contact with telephone wires, suspension strand, cable, guys, and other equipment, as well as contact with the body of the victim unless it is clearly evident that contact with the voltage source does not exist.

4.05 The best position to aid the employee will usually be slightly above and to one side of the injured (see Fig. 4). You will be close enough to see the victim's face clearly. Your head should be higher than the victim's, which will enable you to give mouth-to-mouth resuscitation if required. You will also be able to tie the rescue hitch much easier from this position.

5. FREEING EMPLOYEE FROM CONTACT WITH A LIVE CIRCUIT OF LESS THAN 10,000 VOLTS TO GROUND

5.01 In electric shock cases, the rescuer should wear insulating gloves throughout the operation where he might be exposed to a possible shock. If insulating gloves are not available, rescue work may be undertaken only if the power contact can first be cleared safely, such as by the use of a dry rope, dry board, dry tree pruner, nonmetal ladder, "B" clearance rule, etc, or by opening a switch. The rescuer must remain calm, think clearly, and avoid impulsive and unsafe operations. Keep in mind the fact that wet or damp articles are not safe insulators and severe shock can be transmitted by them.

5.02 When handling wires that may be "hot," use only one hand if practical and keep the

Fig. 4—Rescue Position

other hand behind you and keep other parts of the body clear of wires, guys, suspension strand, cable terminals, or other grounded structures.

5.03 If the voltage source is evident, the contact should be eliminated without handling the supply conductors. In some cases, it may be possible to clear the contact by throwing a dry handline over the telephone or supply wires and pulling them apart or by pushing them apart with the ladder, a dry branch, or other wooden tool part such as a tree pruner handle, "B" clearance rule, or pike pole. Do not use green or damp wood to separate the wires and avoid standing on wet ground or in water.

5.04 If it is necessary to cut energized telephone wires, insulating gloves must be worn. A tree pruner with a dry pull rope may be used to cut the wires.

5.05 Under extreme conditions, power company circuits with voltages under 10,000 volts to ground may be cut provided that rubber gloves are worn while the wires are being cut. Strict attention must be given to determine where the wires will fall.

6. FREEING EMPLOYEE FROM CONTACT WITH A LIVE CIRCUIT OF MORE THAN 10,000 VOLTS TO GROUND

Warning: Do not attempt to cut a circuit where the voltage exceeds 10,000 volts to ground.

6.01 Since the insulating gloves are not designed to protect against these higher voltages, extreme caution must exercise when a victim is in contact with a voltage over 10,000 volts to ground.

6.02 If, in electric shock cases, where the victim remains in contact with either energized telephone or power wires and it is apparent that the current has passed through the heart, the rescuer should request the assistance of the power company to break the contact or open the circuit before proceeding with the rescue.

6.03 If the power contact is limited to only part of the victim's body (arm to ground), and not through the heart, extreme caution in removing the power contact should be considered. Insulating gloves and blankets, in good condition, together with a dry rope, tree pruner, ladder, etc, could be used under this condition.

Note: This method should not be used under damp or wet weather conditions or if the rescuer is not sure that the device used to break the power contact is free from moisture.

6.04 The rescuer wearing insulating gloves and standing on an insulating blanket, or other dry insulated material, can use a dry rope, nonmetal ladder, or tree pruner to break the power contact from the ground level. A "B" clearance rule is sufficient for any voltage likely to be encountered.

Warning: A rescuer must not come in contact with a down guy, pole, or any other object while attempting to break the power contact.

6.05 Under no circumstances should the rescuer attempt to break the power contact by wearing only the insulating gloves.

7. POLE TOP RESCUE

7.01 The assistance rendered to a victim is dependent upon the victim's condition. Examine the victim and make your determination as to the course of action to be taken. The rescuer must determine if the victim is conscious, breathing, and if the heart is beating. The way to determine if the victim's heart is beating is to feel for a pulse beat at the neck, check the victim's eye to see if the pupil reacts to light, and determine if the victim's color is normal.

7.02 The carotid pulse at the neck can be detected with two fingers placed flatly against the neck and at the Adam's apple. Slide the fingers toward the side of the victim's neck to detect the pulse beat (see Fig. 5).

Fig. 5—Checking Victim's Pulse With Fingers

7.03 By checking the victim's eye, the pupil will give a good indication of whether a heart is beating. A pupil that remains constricted or continues to react to light indicates the heart is beating. A fixed, dilated pupil with a glass appearance indicates that serious brain damage has occurred.

7.04 If the victim is conscious—in this instance time may not be a factor. There is no emergency to get the victim off the pole immediately. Reassure the victim and administer the necessary first aid.

7.05 If the victim is unconscious but breathing—keep a close watch on the victim to be sure he continues to breath. Lower the victim to the ground level if consciousness is not regained in a reasonable length of time.

7.06 If the victim is unconscious with the heart beating but not breathing—administer mouth-to-mouth resuscitation; lower the victim to the ground after he is breathing on his own.

7.07 If the victim is unconscious with the heart not beating and also not breathing, this is the most serious condition. Prepare to lower the victim to the ground immediately. Give the victim five breaths by mouth-to-mouth resuscitation, and lower the victim to the ground.

7.08 Pole top mouth-to-mouth resuscitation is the most effective method to provide maximum lung ventilation to a victim on a pole when normal respiration has stopped.

7.09 If normal breathing has stopped, the prompt application of artificial respiration is extremely important. The importance of early ventilation of the lungs is shown by the following:

PERCENT CHANCE FOR SURVIVAL	MINUTES AFTER BREATHING HAS STOPPED
98%	1 min.
90%	2 min.
55%	3 min.
30%	4 min.
15%	5 min.

7.10 The specific first aid techniques to be administered to the victim will be performed in accordance with the American Red Cross First Aid Text Book and the Bell System First Aid and Personal Safety Course both on the pole and after being lowered.

8. LOWERING EMPLOYEE FROM POLE

8.01 If the arrival of a trained emergency unit (rescue squad, fire department, police, etc) is not eminent, proceed as follows: Place a rescue rope over a crossarm, cable and strand, or other attachment of suitable strength about 2 feet out from the pole. If working alone, take one complete wrap (see Fig. 6) around crossarm, cable and strand, or other fixture so as to provide snubbing action to assist in holding the victim's weight. A single wrap is sufficient. If more than one turn is taken, the line may cross and will bind when lowering the victim.

Fig. 6—Placing Rescue Rope Around Strand

8.02 Allow enough rope (1-1/2 to 2 feet longer than the victim) to secure the victim.

8.03 Make one complete wrap around the victim's body, high up under the armpits (see Fig. 7). Keep the line high up under the armpits so it will not have to be raised later.

8.04 Tie three half-hitches (see Fig. 7) at the side and front or back of the victim to keep the knot away from the victim's head.

Fig. 7—Placing and Securing Rescue Rope to Victim

8.05 Snub the knot and slide the knot down tight against the victim's chest (see Fig. 7). This keeps the line tight around the victim's back muscles and makes it impossible for the arms to be raised.

8.06 Remove slack from the hand line and keep a firm grip on the fall line. Cut or release the victim's safety strap and lower the victim to the ground.

8.07 When sufficient help is available, the rescuer and the assistant shall work together in lowering the victim. In this case, the assistant at the ground level should control the rope to lower the victim while the rescuer guides the victim to the ground.